Russian Journal of Electrochemistry 2008 vol.44 N12, pages 1345-1349

Adsorption and oxidation of purine bases and their derivatives on electrodes modified with carbon nanotubes

Abdullin T., Nikitina I., Bondar' O.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The electrochemical behavior of nitrogen bases and their derivatives is studied on electrodes modified with carbon nanotubes. On these electrodes, the strong adsorption of purines and their oxidation is observed at potentials in the vicinity of +0.8 V for guanine and +1.0 V (vs. Ag/AgCl) for guanine nucleosides/nucleotides and adenine. At more positive potentials, the high background current prevents the detection of adenine nucleotides and pyrimidines. The peculiarities of oxidation of the most easily detectable DNA components, namely, guanine and deoxyguanosinemonophosphate, on modified electrodes are elucidated and the corresponding reaction scheme is proposed. The results can be used in the development of biosensors based on electroactive properties of nucleic acids and their components. © 2008 MAIK Nauka.

http://dx.doi.org/10.1134/S1023193508120069

Keywords

8-oxoguanine, Adsorption, Carbon nanotubes, DNA sensors, Electrochemical oxidation, Nitrogen bases and nucleotides